PERC 2023 Abstract Detail Page

Wednesday, July 19, 5:00pm Pacific Time

Abstract Title:	**Investigating context dependence of introductory and advanced student responses to introductory thermodynamics conceptual problems**
Abstract Type:	Contributed Poster Presentation

Abstract:	We use a validated multiple-choice survey instrument focusing on thermodynamic processes and the first and second laws of thermodynamics to investigate context dependence of introductory and advanced student reasoning in introductory thermodynamics. The survey includes items that incorporate many contexts involving variables such as internal energy, work done by a system, and heat transfer; here, however, we focus exclusively on entropy. We present analysis of data in multiple contexts reflecting students' ideas about the change in entropy of a gas, both in spontaneous/irreversible processes and in cyclic processes. Consistent with prior studies, we find the idea that entropy is constant for an isolated system to be widely prevalent among introductory students, while advanced students--by contrast--had great difficulty with situations in which entropy of the system does not increase. Thus, our findings using a validated survey confirm the findings of prior research in multiple contexts.

Session Time:	Poster Session 1
Poster Number:	A2

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